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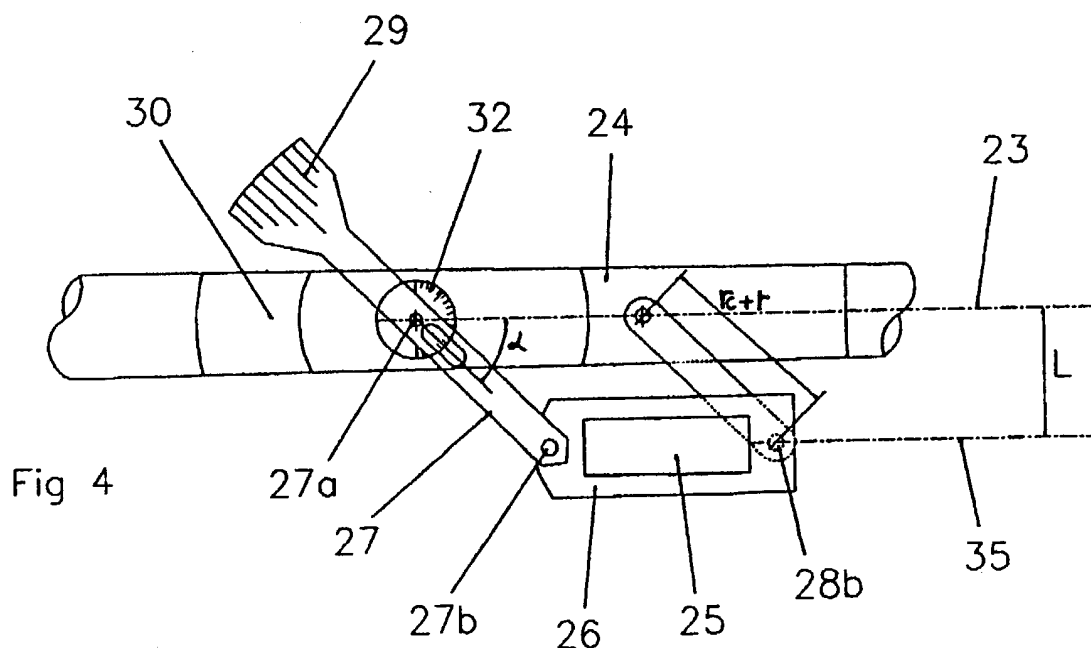
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GB 2243085 A US 4688796 A US 3411779 A

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UK CL (Edition M ) A6H HFH  
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(54) A snooker cue

(57) A snooker cue carries a battery powered laser 25 for emitting a light signal which is aimed at a target ball so that a cue ball struck by the cue will strike the target ball accurately. The laser 25 is mounted on a parallelogram arm arrangement 27, 28 which enables the laser 25 to be moved from a storage position within the cue to an offset position to one side of the cue. A dial 32 is also provided on the cue to indicate the direction of movement of the cue ball after impact with the target ball. In an alternative embodiment, a radio transmitter and receiver are provided on the cue.



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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

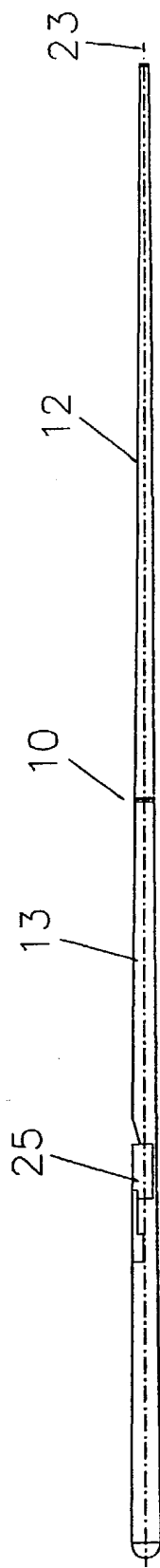


Fig 1

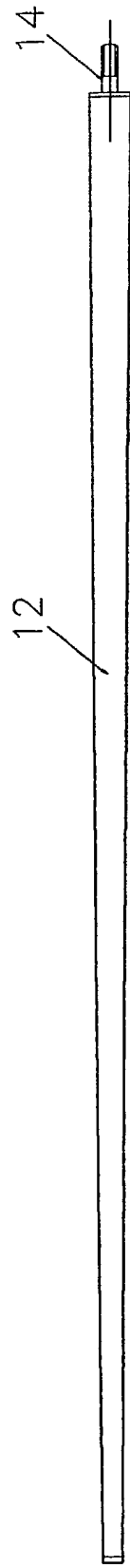


Fig 2

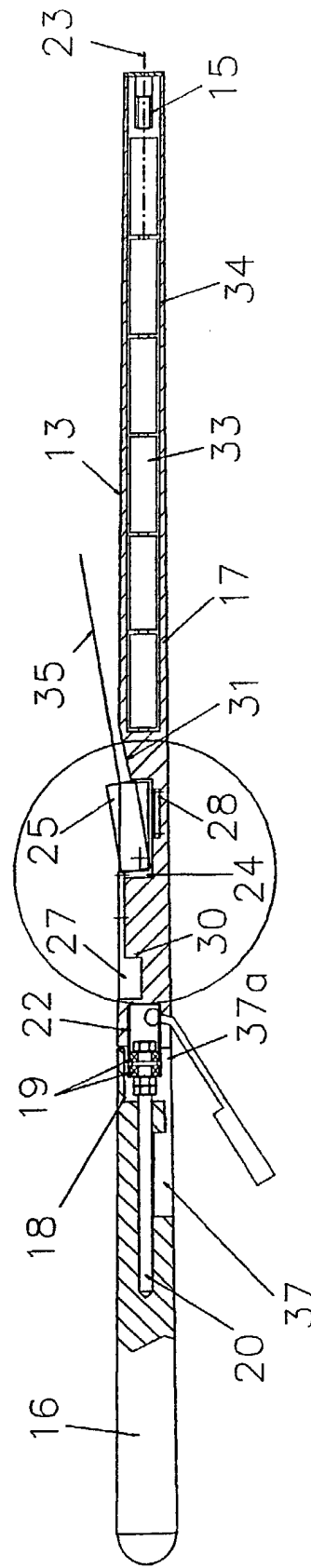


Fig 3

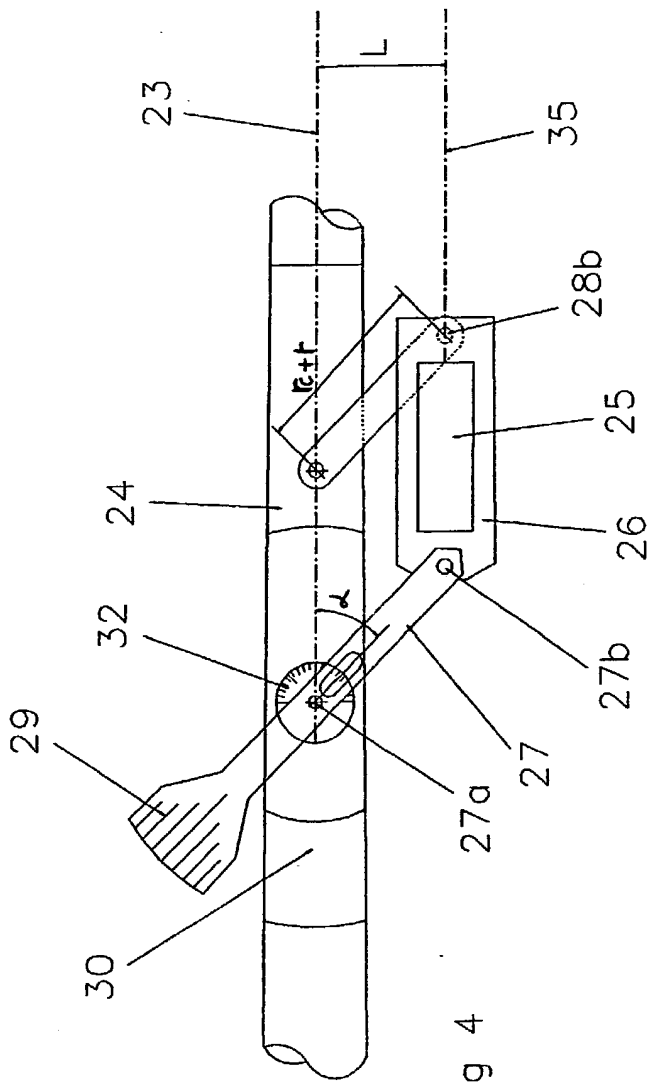


Fig 4

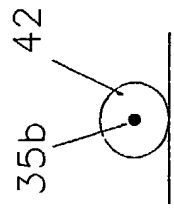


Fig 7

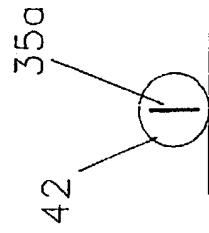


Fig 6

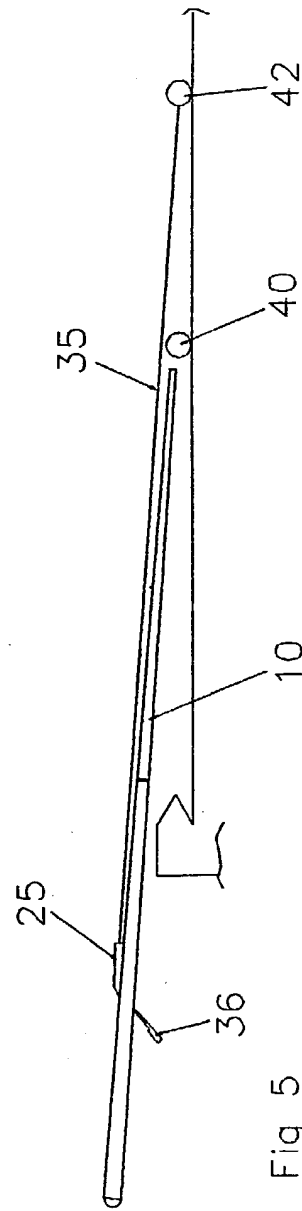
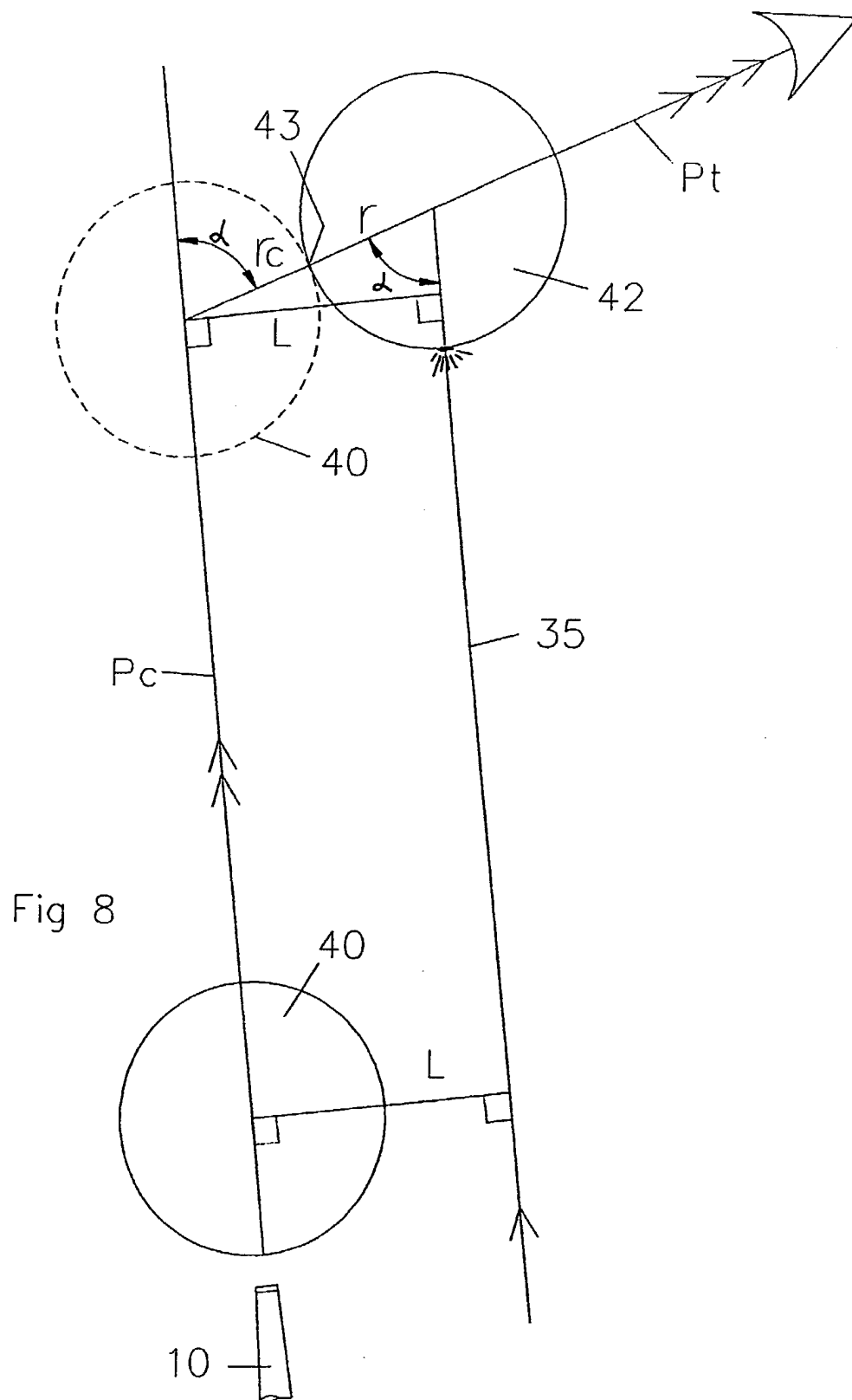


Fig 5



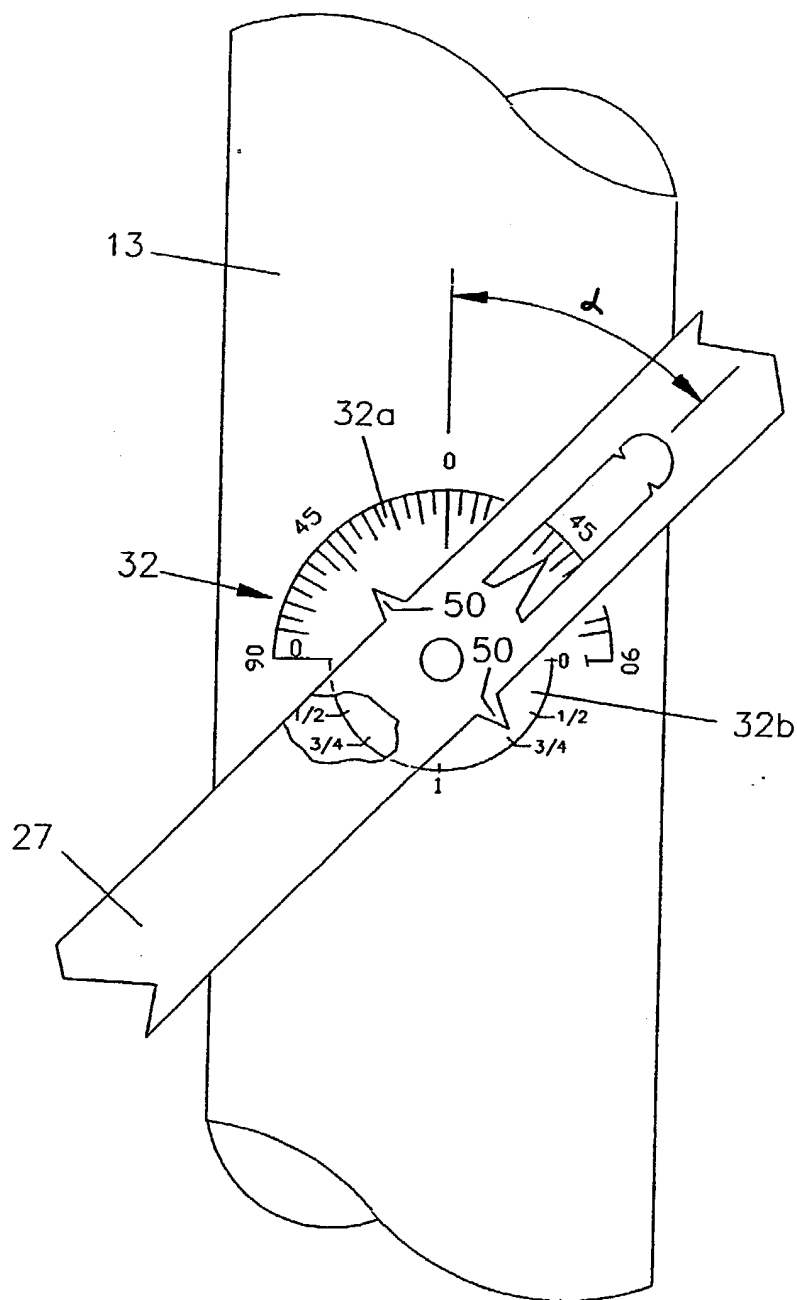


Fig 9

A CUE FOR SNOOKER OR LIKE GAME

The invention relates to a cue for snooker or like game.

The game of snooker has grown in popularity in recent years and those who are new to the game frequently wish  
5 to improve their performance as quickly as possible. One object of the present invention is to provide a cue which will help players of the game to become proficient more quickly.

According to the invention there is provided a cue for  
10 snooker or like game comprising an elongate body and an emitting device on the body arranged to emit a signal which is aimable at a ball used in the game.

Preferably, the signal is a beam of light which is projected towards the ball.

15 Typically, the ball at which the signal is aimed is a target ball normally intended to be struck by a cue ball. Where, say, a light beam is used, it is preferably arranged to illuminate a particular part of the target ball to assist the user in aligning the cue so that the  
20 cue ball will strike the target ball accurately. In such a case, the light beam may be arranged to provide an illumination in the form of a spot or a verticle line on

the ball.

The emitting device may be movable between a position in which it is housed generally within the elongate body an offset position in which it lies to one side of the body.

- 5 To enable such movements to be made, the emitting device may be mounted on the body by a parallelogram arm arrangement.

The elongate body may be formed with a recess for housing the emitting device and the emitting device may be  
10 movable out of the recess to the aforesaid offset position.

The emitting device may normally be arranged to emit the signal such that it is projected at an angle to the longitudinal axis of the cue. Normally, the signal will  
15 be projected in a vertical plane containing the longitudinal axis of the cue and the cue will, therefore, need to be tilted in the vertical plane to enable the signal to be projected towards the ball.

Where the target ball is to be struck by the cue ball so  
20 that it deflects obliquely to the direction of travel of the cue ball, the emitting device is placed in its offset position for aiming the signal at the target ball. In that way that the cue ball will strike the target ball in precisely the position required to deflect the target

along the required path.

Means may be provided for indicating a ratio of the speed of the cue ball after impact with the target ball to the speed of the cue ball prior to impact.

- 5 An indicator may be provided which indicates the direction of movement of the cue ball after impact with the target ball.

The aforesaid means for indicating the speed ratio may comprise graduations on a dial. A pointer or cursor used  
10 to align with graduations on the dial may be used to provide the indicator for indicating the direction of movement of the cue ball.

The elongate body may comprise a first part and a second part rotatably mounted on the first part for rotation  
15 about the axis of the cue, the emitting device being mounted on the second part. Preferably, means is provided to bias the second part into a rotational position relative to the first part such that the projected signal and the longitudinal axis of the cue lie  
20 in a common vertical plane. The biasing means may comprise a weight arranged to extend downwardly from the second part immediately beneath the longitudinal axis of the cue. If desired, the weight may be movable from its biasing position to a stowed position in which it may be



housed at least partly within the first part of the elongate body.

Where the emitting device is arranged to be movable to an offset position as set out above, the weight of the  
5 emitting device on one side of the cue is preferably countered by means of a counterweight which projects from the other side of the cue. Where the aforesaid parallelogram arm arrangement is provided, the counterweight may be provided on an extension of one of  
10 the parallelogram arms.

The elongate body is preferably arranged to have a power source for the emitting device such as a plurality of batteries.

Where the emitting device is arranged to provide a beam  
15 of light, the emitting device may be in the form of a laser.

A cue for snooker or like game in accordance with the invention will now be described by way of example with reference to the accompanying drawings in which:-

20 Fig. 1 is an elevation of the assembled cue in accordance with the invention:-

Fig. 2 is a front section of the cue of Fig. 1,

Fig. 3 is an elevation shown partly in cross-section of a back section of the cue of Fig. 1,

Fig. 4 is a plan view drawn to a larger scale of an encircled part of the back section with the emitting  
5 device in an offset position,

Fig. 5 is a diagrammatic elevation showing one way in which a cue in accordance with the invention is used,

Fig. 6 and 7 illustrate target balls on which two different forms of light beam are impinging,

10 Fig. 8 is a diagrammatic plan view of cue and target balls illustrating the way in which the arrangement shown in Fig 4 can be used to align a target ball which is to be deflected to one side of the path followed by the cue ball, and

15 Fig.9 is a plan view of part of a cue in accordance with the invention showing a speed ratio and angle indicating dial.

The cue comprises a front section 12 and a back section 13. In conventional manner, the front section 12 is  
20 provided with a connecting screw 14 which can be screwed into a socket 15 at the front end of the back section 13.

The back section 13 comprises first and second parts 16, 17. The first part 16 constitutes a handle for the cue 10 and is formed with a counterbore 18 at its front end. The counterbore 18 houses spaced apart bearings 19 5 mounted at one end of a shaft 20 extending into the handle. The second part 17 of the back section is provided with a tubular extension 22 which is axially secured to outer races of the bearings 19 whereby the first and second parts 16,17 of the back section 13 can 10 rotate relative to each other about the longitudinal axis of the cue indicated at 23.

The second part 17 is formed with a recess 24 which receives a light emitting device in the form of a laser 25. The laser 25 is carried by a mounting 26 supported 15 by respective upper and lower parallelogram arm 27,28. The parallelogram arms 27,28 permit the laser 25 to be moved from a position in which it is contained within the recess 24 as shown in Fig. 3 to an offset position clear of the recess 24 as shown in Fig. 4. The parallelogram 20 arm 27 is longer than the parallelogram arm 28 and extends beyond the other side of the cue 10 when the laser is positioned as shown in Fig. 4, the outer end of the parallelogram arm 27 being provided with a counter weight 29 which balances the weights of the laser 25, the 25 mounting 26 and the arms 27,28 on the opposite side of the axis 23. In that way, there is no tendency for the offset laser to turn the cue about its axis 23.

In the Fig. 3 position, the parallelogram arm 27 and its counter weight 29 are housed within a recess arrangement 30 on the first section 17. The arms 27, 28 are connected to the first section 17 of the cue 10 by means of pivots 27a, 28a respectively, and to the mounting 26 by means of pivots 27b, 28b. A graduated dial 32 coaxial with the pivot 27a is provided immediately adjacent the parallelogram arm 27 to indicate the angular position of the arm 27 relative to the cue axis 23.

10 The laser 25 is powered by a series of batteries 33 arranged within a bore 34 in the second part 17. The batteries 33 are suitably secured in position within the bore 34 and power is drawn therefrom via wiring (not shown) connected to the laser 25. A suitable switch (not  
15 shown) may be provided for switching on and off the power supply to the laser 25.

As shown in Fig. 3, the laser is normally tipped upwardly so that its beam of light 35 is inclined to the axis 23 of the cue 10. The angle of inclination is shown  
20 exaggerated in Fig. 3 for illustrative purposes. The angle of inclination is likely to be more shallow as indicated in Fig. 5. With the laser 25 arranged within the recess 24 as shown in Fig. 3, the rotational position of the second part 17 relative to the first part 16 of  
25 the back section 13 is arranged such that the beam 35 and the longitudinal axis 23 lie in a common vertical plane.

Such a rotary position of the second part 17 relative to the first part 16 is maintained by a ballast weight 36 pivotally mounted on the second part 17 and which normally hangs down immediately beneath the axis 23 as shown in Fig. 3. When the laser 25 is not in use, it can be positioned horizontally in the broken line position shown in Fig. 3 and the ballast weight 36 can be folded upwardly so that it is received partly within a recess 37 in the first part 16 and a further recess 37a formed in the second part 17.

The second part 17 is cut away as indicated at 31 to clear the beam 35.

Referring to Fig. 5, the cue 10 is positioned to strike a cue ball 40 so as to drive it towards a target ball 42. In Fig. 5, it is intended that the target ball 42 be struck such that it continues in a path in line with the path followed by the cue ball 40. In order to align the cue 10 with the target ball 42, the cue is positioned such that the light beam 35 impinges centrally on the target ball 42 and the cue ball is then struck with the cue. As shown in Figs. 6 and 7, the light beam 35 can either produce a vertical line of light 35a on the target ball 42 or a spot 35b.

Referring to Figs 4 and 8, there will be times when the target ball 42 is to be driven along a path Pt inclined

at an angle  $\alpha$  to a path Pc followed by the cue ball 40. In order to ensure that the cue ball 40 strikes the target ball 42 at the correct contact point 43, the laser 25 is moved to an appropriate offset position. The user of the cue is able to determine quite accurately by sight the angle of inclination of the path Pt relative to the path Pc and moves the arm 27 about its pivot 27a until the arm lies at that angle  $\alpha$  to the axis 23 of the cue. The length of the arm 28 between its pivots 28a, 28b and the length of the corresponding part of arm 27 is  $rc+r$  ie the sum of the radii of the cue ball 40 and the target ball 42. Once the angle  $\alpha$  has been set by the user, the distance between the cue axis 23 and the beam of light 35 will correspond to the length L so that the light beam 35 will impinge centrally on the target ball 42 as shown in Fig. 8. When the cue ball 40 is struck, it will then contact the target ball 42 at the correct point 43 so that the target ball is driven along the required path Pt.

The length L is given by the equation

$$L = \sin \alpha (rc + r)$$

A more accurate way of setting the angle  $\alpha$  is as follows:

If the centre of the dial 32 is positioned over the centre of the cue ball 40 with the cue directly above and in alignment with path Pc, the arm 27 can be pivoted to

point directly at a pocket at which the target ball is to be projected. In that way the correct angle  $\alpha$  can be set so that when the cue is positioned as in Figs 4 and 8, the beam 35 will strike the target ball 42 as shown and the distance L will be correctly set.

Fig.9 shows the way in which the dial 32 can be modified to provide an indication of the speed of the cue ball 40 following impact with the target ball 42. The dial 32 includes an angular setting section 32a by which the angle  $\alpha$  can be set and a speed indicating section 32b. Where angle  $\alpha$  is set at  $0^\circ$  by the arm 27 (shown partly broken away) the cue ball 40 will strike the target ball 42 such that the centres of both balls and the cue axis 23 lie in the same vertical plane and the speed of the cue ball 40 following impact with the target ball will be zero. If the angle  $\alpha$  is  $90^\circ$  there will theoretically be no contact with the target ball in the Fig. 8 arrangement and therefore the speed of the cue ball will remain unchanged ie 1. Where the angle  $\alpha$  is set at an intermediate position eg  $\alpha = 30^\circ$ , the speed following impact will be substantially  $1/2$  that prior to impact based on the equation

$$V_1 = V \sin \alpha$$

where  $V$  = speed of cue ball prior to impact with the target ball

$V_1$  = speed of cue ball after impact.

The dial therefore provides an indication of the ratio of

cue ball speed after impact to cue ball speed prior to impact with the target ball.

The arm 27 is formed with two opposed pointers 50 each of which is used to point at the dial section 32b depending  
5 on whether the cue 27 points from one side of the cue or the other. The pointer 50 which does not point at the dial section 32b points in the direction that cue ball will move following impact with the target ball. Thus, one pointer 50 indicates cue ball 40 speed ratio after  
10 impact with the target ball and the other pointer indicates direction of movement of the cue ball 40 after such impact.

It will be appreciated that a cue in accordance with the invention will provide a very useful aid, particularly to  
15 a beginner, for achieving accuracy in the game of snooker. The cue could likewise be used in the game of pool or billiards. However, where the user does not wish to utilise the laser beam, the laser 25 can be housed completely within the recess 24 and the ballast weight 36  
20 housed within the recesses 37, 37a so that the cue can be used as a normal snooker cue with no projecting parts.

Instead of using a laser 25, a focused lamp could be provided. It is also envisaged that other forms of emitted signal could be provided. For example, it is  
25 envisaged that an emitted radio signal could be reflected



from the target ball 42 and received by a receiver on the cue which would indicate to the user a correct alignment of the cue.

## CLAIMS

1. A cue for snooker or like game comprising an elongate body and an emitting device on the body arranged to emit a signal which is aimable at a ball used in the game.

2. A cue according to Claim 1 in which the signal is a beam of light which is to be projected towards the ball.

3. A cue according to Claim 2 in which the light beam is arranged to provide an illumination in the form of a spot or line on the ball.

4. A cue according to Claim 1, 2 or 3, in which the emitting device is movable between a position in which it is housed generally within the elongate body and an offset position in which it lies to one side of the body.

5. A cue according to Claim 4 in which the emitting device is mounted on the elongate body by a parallelogram arm arrangement.

6. A cue according to Claim 4 or 5 in which the elongate body is formed with a recess for housing the emitting device.

7. A cue according to Claim 6 in which the emitting device is movable out of the recess to the aforesaid offset position.

5 8. A cue according to any preceding Claim in which the emitting device is normally arranged to emit the signal such that it is projected at an angle to the longitudinal axis of the cue.

10 9. A cue according to any preceding claim, the cue normally being arranged to strike a cue ball for impact with the ball at which the signal is aimed, means being provided for indicating a ratio of the speed of the cue ball after impact with the other ball to the speed of the  
15 cue ball prior to impact.

10. A cue according to Claim 9 in which the means for indicating the speed ratio comprises graduations on a dial.

20 11. A cue according to any preceding claim the cue normally being arranged to strike a cue ball for impact with the ball at which the signal is aimed, an indicator being provided which indicates the direction of movement  
25 of the cue ball after impact with the other ball.

12. A cue according to Claim 11 in which the indicator

for indicating the direction of movement of the cue ball after impact with the other ball comprises graduations on a dial.

5      13. A cue according to Claim 12 in which a pointer or cursor used to align with the graduations of the dial constitutes the indicator for indicating the direction of movement of the cue ball.

10      14. A cue according to Claim 12 or 13 when appendant to Claim 10 in which the dial is graduated to provide both an indication of the speed ratio and the direction of movement of the cue ball.

15      15. A cue according to Claim 14 when appendant to Claim 13 in which two pointers or cursors are provided for indicating the speed ratio and direction of movement of the cue ball simultaneously.

20      16. A cue according to any preceding Claim in which the elongate body comprises a first part and a second part rotatably mounted on the first part for rotation about the axis of the cue, the emitting device being mounted on the second part.

25      17. A cue according to Claim 16 in which means is provided to bias the second part into a rotational

position relative to the first part such that the projected signal and the longitudinal axis of the cue can lie in a common vertical plane.

5      18. A cue according to Claim 17 in which the biasing means comprises a weight arranged to extend downwardly from the second part immediately beneath the longitudinal axis of the cue.

10      19. A cue according to Claim 18 in which the weight is movable from its biasing position to a stowed position.

15      20. A cue according to Claim 19 in which, in its stowed position, the weight is housed at least partly within the first part of the elongate body.

20      21. A cue according to Claim 4 or any preceding Claim dependent on Claim 4 in which the weight of the emitting device when offset to one side of the elongate body is countered by means of a counterweight on the other side of the elongate body.

25      22. A cue according to Claim 21 and where the said parallelogram arm arrangement is provided, in which the counterweight is provided on an extension of one of the parallelogram arms.

23. A cue according to any preceding Claim, in which the elongate body includes a power source for the emitting device.

5 24. A cue for snooker or like game constructed and arranged substantially as described herein with reference to the accompanying drawings.

10 25. A method of projecting a cue ball towards a target ball in snooker or a like game comprising providing a cue having an elongate body, causing an emitting device on the cue to emit a signal, aiming the signal towards the target ball, and using the cue to project the cue ball towards the target ball so that the cue ball will strike  
15 the target ball at a desired position.

26. A method according to Claim 25 including projecting the signal in a vertical plane containing the longitudinal axis of the cue.

20

27. A method according to Claim 25 or 26 including tilting the cue in a vertical plane to enable the signal to be projected towards the ball.

25 28. A method according to Claim 25 or Claim 27 when appendant to Claim 25 or 27 and where the target ball is to be struck by the cue ball so that it deflects

obliquely to the direction of travel of the cue ball, including positioning the emitting device in an offset position to one side of the elongate body and aiming the signal at the target ball from the offset position.

5

29. A method of projecting a cue ball towards a target ball in snooker or a like game substantially as described herein with reference to the accompanying drawings.

**Patents Act 1977**  
**Examiner's report to the Comptroller under Section 17** -19-  
**(The Search report)**

Application number  
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**Relevant Technical Fields**

- (i) UK Cl (Ed.M) A6H (HFH)  
(ii) Int Cl (Ed.5) A63D (15/00, 15/08)

Search Examiner  
Phil Thorpe

Date of completion of Search  
24 May 1994

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASE : WPI

Documents considered relevant following a search in respect of Claims :-  
1-29

**Categories of documents**

- |   |   |
|---|---|
| <b>X:</b> Document indicating lack of novelty or of inventive step.   | <b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.        |
| <b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category. | <b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| <b>A:</b> Document indicating technological background and/or state of the art.   | <b>&amp;:</b> Member of the same patent family; corresponding document.   |

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2243085 A (MEADOWS) see especially page 4 lines 13-25	1-3
X: Y:	US 4688796 (WRIGHT) see whole document	X:1-3,16,17,23,25-27 Y:9-14
Y:	US 3411779 (McGOWAN) see whole document	9-14

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